

## METHOD AND APPARATUS FOR MANAGING A WIRELESS TRANSMITTER

### TECHNICAL FIELD

[0001] The present application relates generally to coexistence of more than one kind of radio communication in a frequency band.

### BACKGROUND

[0002] Wireless communication between electronic devices requires that devices participating in the communication, for example a base station and a mobile station, are configured to conform to an agreed framework for communication. The agreed framework comprises defined procedures that are used to effect the communication in the framework context, wherein the context may comprise for example air interface resources, or radio resources, such as at least one frequency band. Such frameworks may be known as radio access technologies, or RATs. A RAT may be defined in industry standards that device manufacturers can refer to when designing products such that they are capable of communicating according to the RAT.

[0003] When standards are used correctly, interoperability between devices from a plurality of suppliers may be achieved. For example, a cellular telephone produced by a first manufacturer may be capable of communicating with a cellular telephone produced by a second manufacturer, using a base station produced by a third manufacturer and a core network produced by a fourth manufacturer.

[0004] Radio access technologies may be designed for specific use cases in mind. For example, cellular telephony RATs may be optimized for ease of roaming, wide-area coverage and battery power efficiency. On the other hand, other RATs such as those designed for wireless hotspots for stationary users may be optimized to produce high peak data rates in the network to mobile direction.

[0005] Methods to improve interoperation between RATs may include, for example, selecting non-overlapping frequency ranges for the respective RATs to avoid interference. Alternatively or in addition communications pertaining to each RAT may be sequenced so that only one RAT is active at any given time. For example, a communication device may partition time into consecutive non-overlapping timeslots, and assign the timeslots to different RATs the communication device is configured to communicate in accordance with.

[0006] Cognitive radios operate by sharing a spectrum band dynamically. A cognitive radio may be configured to use a defined spectrum resource in a subordinate manner, wherein the cognitive radio will determine whether the spectrum resource is unused before using it to convey information. A cognitive radio may be configured to detect if a privileged node is accessing the same spectrum resource, responsive to which the cognitive radio may be configured to vacate the spectrum resource to avoid collision with the privileged node.

### SUMMARY

[0007] Various aspects of examples of the invention are set out in the claims.

[0008] According to a first aspect of the present invention, there is provided an apparatus, comprising a memory configured to store at least one first parameter, at least one processing core configured to control, using a cognitive radio principle, radio transmission using a first radio access technology,

wherein the at least one first parameter is used in the cognitive radio principle, wherein the at least one processing core is configured to select the at least one first parameter in dependence of at least one second parameter, wherein the at least one second parameter at least one of relates to a second radio access technology and comprises a length of a last burst or silent period of the first radio access technology.

[0009] According to a second aspect of the present invention, there is provided a method, comprising storing at least one first parameter, controlling, using a cognitive radio principle, radio transmission using a first radio access technology, wherein the at least one first parameter is used in the cognitive radio principle, and selecting the at least one first parameter in dependence of at least one second parameter, wherein the at least one second parameter at least one of relates to a second radio access technology and comprises a length of a last burst or silent period of the first radio access technology.

[0010] According to a third aspect of the present invention, there is provided a computer program product comprising a computer-readable medium bearing computer program code embodied therein for use with a computer, the computer program code comprising code for storing at least one first parameter, code for controlling, using a cognitive radio principle, radio transmission using a first radio access technology, wherein the at least one first parameter is used in the cognitive radio principle, and code for selecting the at least one first parameter in dependence of at least one second parameter, wherein the at least one second parameter at least one of relates to a second radio access technology and comprises a length of a last burst or silent period of the first radio access technology.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0011] For a more complete understanding of example embodiments of the present invention, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

[0012] FIG. 1 illustrates an example system where at least some embodiments of the present invention may be employed

[0013] FIG. 2 illustrates a block diagram of an apparatus such as, for example, a mobile terminal, in accordance with an example embodiment of the invention;

[0014] FIG. 3 is a flow diagram showing operations in accordance with a method in an example embodiment of the invention.

[0015] FIG. 4A illustrates a first transmission timing diagram according to an example embodiment of the invention.

[0016] FIG. 4B illustrates a second transmission timing diagram according to an example embodiment of the invention.

[0017] FIG. 4C illustrates a third transmission timing diagram according to an example embodiment of the invention.

[0018] FIG. 5A illustrates a fourth transmission timing diagram according to an example embodiment of the invention.

[0019] FIG. 5B illustrates a fifth transmission timing diagram according to an example embodiment of the invention.

[0020] FIG. 5C illustrates a sixth transmission timing diagram according to an example embodiment of the invention.

### DETAILED DESCRIPTION OF THE DRAWINGS

[0021] An example embodiment of the present invention and its potential advantages are understood by referring to FIGS. 1 through 5 of the drawings.